CLAIMS

1. (previously presented) A method for reducing spurious emissions in an amplified signal by applying pre-distortion, whose magnitude is frequency-dependent, to an input signal to generate a pre-distorted signal, such that, when the pre-distorted signal is applied to an amplifier to generate the amplified signal, the pre-distortion reduces spurious emissions in the amplified signal, wherein the pre-distorted signal is generated by:

(a) generating a first frequency-dependent pre-distortion signal corresponding to a first set of frequency components for the input signal;

(b) generating a second frequency-dependent pre-distortion signal corresponding to a second set of frequency components for the input signal, wherein the first set of frequency components is different from the second set of frequency components; and

(c) combining the first and second frequency-dependent pre-distortion signals to generate the pre-distorted signal, wherein:

the first set of frequency components corresponds to positive frequency components of the input signal; and

the second set of frequency components corresponds to negative frequency components of the input signal.

2. (previously presented) The method of claim 1, wherein the phase of the pre-distortion is also frequency-dependent.

3. (canceled)

4. (previously presented) The method of claim 1, wherein:

the first frequency-dependent pre-distortion signal is generated by:

(1) generating a first set of one or more waveforms corresponding to a first set of one or more pre-distortion parameters;

(2) differentiating the first set of one or more waveforms with respect to time to generate a first set of one or more differentiated waveforms; and

(3) applying the first set of one or more differentiated waveforms to a positive-frequency operation to generate the first frequency-dependent pre-distortion signal; and

the second frequency-dependent pre-distortion signal is generated by:

(1) generating a second set of one or more waveforms corresponding to a second set of one or more pre-distortion parameters;

(2) differentiating the second set of one or more waveforms with respect to time to generate a second set of one or more differentiated waveforms; and

(3) applying the second set of one or more differentiated waveforms to a negative-frequency operation to generate the second frequency-dependent pre-distortion signal.

5-6. (canceled)

7. (previously presented) The method of claim 1, further comprising the step of generating a frequency-independent pre-distorted signal from the input signal, wherein the frequency-independent pre-distorted signal and the first and second frequency-dependent pre-distortion signals are combined to generate the pre-distorted signal.

8. (previously presented) The method of claim 1, wherein:

the input signal is represented in a base-band domain; and

the first and second frequency-dependent pre-distortion signals are generated in a digital domain.

1   9.   (original) An apparatus for applying pre-distortion to an input signal to generate a pre-
2   distorted signal, such that, when the pre-distorted signal is applied to an amplifier to generate an
3   amplified signal, the pre-distortion reduces spurious emissions in the amplified signal, the apparatus
4   comprising:
5   (a)   a first signal processing path adapted to generate a main pre-distortion signal from the
6   input signal;
7   (b)   a second signal processing path adapted to generate a first frequency-dependent pre-
8   distortion signal corresponding to a first set of frequency components for the input signal;
9   (c)   a third signal processing path adapted to generate a second frequency-dependent pre-
10   distortion signal corresponding to a second set of frequency components for the input signal, wherein the
11   first set of frequency components is different from the second set of frequency components; and
12   (d)   a combiner adapted to combine the first and second frequency-dependent pre-distortion
13   signals with the main pre-distortion signal to generate the pre-distorted signal.

1   10.   (previously presented) The apparatus of claim 9, wherein:
2   the first set of frequency components corresponds to positive frequency components of the input
3   signal; and
4   the second set of frequency components corresponds to negative frequency components of the
5   input signal.

1   11.   (previously presented) The apparatus of claim 10, wherein:
2   the first frequency-dependent pre-distortion signal is generated by:
3   (1)   generating a first set of one or more waveforms corresponding to a first set of
4   one or more pre-distortion parameters;
5   (2)   differentiating the first set of one or more waveforms with respect to time to
6   generate a first set of one or more differentiated waveforms; and
7   (3)   applying the first set of one or more differentiated waveforms to a positive-
8   frequency operation to generate the first frequency-dependent pre-distortion signal; and
9   the second frequency-dependent pre-distortion signal is generated by:
10   (1)   generating a second set of one or more waveforms corresponding to a second set
11   of one or more pre-distortion parameters;
12   (2)   differentiating the second set of one or more waveforms with respect to time to
13   generate a second set of one or more differentiated waveforms; and
14   (3)   applying the second set of one or more differentiated waveforms to a negative-
15   frequency operation to generate the second frequency-dependent pre-distortion signal.

1   12.   (currently amended) The apparatus of claim 11, wherein the positive-frequency and
2   negative-frequency operations are implemented using filters.

1   13.   (previously presented) The apparatus of claim 9, wherein:
2   the first set of frequency components corresponds to positive and negative frequency components
3   of the input signal; and
4   the second set of frequency components corresponds to only positive frequency components or
5   only negative frequency components of the input signal.

1   14.   (previously presented) The apparatus of claim 13, wherein:
2   the first frequency-dependent pre-distortion signal is generated by:
3   (1)   generating a first set of one or more waveforms corresponding to a first set of
4   one or more pre-distortion parameters;

5   (2)   differentiating the first set of one or more waveforms with respect to time to
6   generate the first frequency-dependent pre-distortion signal; and
7   the second frequency-dependent pre-distortion signal is generated by:
8   (1)   generating a second set of one or more waveforms corresponding to a second set
9   of one or more pre-distortion parameters;
10   (2)   differentiating the second set of one or more waveforms with respect to time to
11 generate a second set of one or more differentiated waveforms; and
12   (3)   applying the second set of one or more differentiated waveforms to a negative-
13 frequency operation or a positive-frequency operation to generate the second frequency-dependent pre-
14 distortion signal.

1   15.   (previously presented) The apparatus of claim 14, wherein the positive-frequency
2   operation or the negative-frequency operation is implemented using a filter.

1   16.   (previously presented) The apparatus of claim 9, wherein:
2   the input signal is represented in a base-band domain; and
3   the main pre-distortion signal and the first and second frequency-dependent pre-distortion signals
4   are generated in a digital domain.

1   17.   (previously presented) The apparatus of claim 9, wherein:
2   the first signal processing path comprises:
3   (1)   an index generator adapted to generate index values proportional to envelope
4   power of the input signal;
5   (2)   a first look-up table adapted to provide first and second pre-distortion parameters
6   using the index values; and
7   (3)   a first multiplier adapted to multiply the input signal by the first and second pre-
8   distortion parameters to generate the main pre-distortion signal;
9   the second signal processing path comprises:
10   (1)   a second look-up table adapted to provide third and fourth pre-distortion
11 parameters using the index values;
12   (2)   a second multiplier adapted to multiply the input signal by the third and fourth
13 pre-distortion parameters to generate first multiplied signals; and
14   (3)   a first differentiator adapted to differentiate the first multiplied signals with
15 respect to time to generate first differentiated signals; and
16   the third signal processing path comprises:
17   (1)   a third look-up table adapted to provide fifth and sixth pre-distortion parameters
18 using the index values;
19   (2)   a third multiplier adapted to multiply the input signal by the fifth and sixth pre-
20 distortion parameters to generate second multiplied signals; and
21   (3)   a second differentiator adapted to differentiate the second multiplied signals with
22 respect to time to generate second differentiated signals.

1   18.   (previously presented) The apparatus of claim 17, wherein:
2   the second signal processing path further comprises a positive-frequency filter adapted to filter
3   the first differentiated signals to generate the first frequency-dependent predistortion signal; and
4   the third signal processing path further comprises a negative-frequency filter adapted to filter the
5   second differentiated signals to generate the second frequency-dependent predistortion signal.

1   19.   (previously presented) The apparatus of claim 17, wherein:
2   the first differentiated signals are the first frequency-dependent predistortion signal; and

3   the third signal processing path further comprises either a positive-frequency filter or a negative-
4   frequency filter adapted to filter the second differentiated signals to generate the second frequency-
5   dependent predistortion signal.

1   20.   (previously presented) A method for reducing spurious emissions in an amplified signal
2   by applying pre-distortion, whose magnitude is frequency-dependent, to an input signal to generate a pre-
3   distorted signal, such that, when the pre-distorted signal is applied to an amplifier to generate the
4   amplified signal, the pre-distortion reduces spurious emissions in the amplified signal, wherein the pre-
5   distorted signal is generated by:
6   (a)   generating a first frequency-dependent pre-distortion signal corresponding to a first set of
7   frequency components for the input signal;
8   (b)   generating a second frequency-dependent pre-distortion signal corresponding to a second
9   set of frequency components for the input signal, wherein the first set of frequency components is
10   different from the second set of frequency components; and
11   (c)   combining the first and second frequency-dependent pre-distortion signals to generate
12   the pre-distorted signal, wherein:
13   the first set of frequency components corresponds to positive and negative frequency
14   components of the input signal; and
15   the second set of frequency components corresponds to only positive frequency
16   components or only negative frequency components of the input signal.

1   21.   (previously presented) The method of claim 20, wherein the phase of the pre-distortion
2   is also frequency-dependent.

1   22.   (previously presented) The method of claim 20, wherein:
2   the first frequency-dependent pre-distortion signal is generated by:
3   (1)   generating a first set of one or more waveforms corresponding to a first set of
4   one or more pre-distortion parameters;
5   (2)   differentiating the first set of one or more waveforms with respect to time to
6   generate the first frequency-dependent pre-distortion signal; and
7   the second frequency-dependent pre-distortion signal is generated by:
8   (1)   generating a second set of one or more waveforms corresponding to a second set
9   of one or more pre-distortion parameters;
10   (2)   differentiating the second set of one or more waveforms with respect to time to
11   generate a second set of one or more differentiated waveforms; and
12   (3)   applying the second set of one or more differentiated waveforms to a negative-
13   frequency operation or a positive-frequency operation to generate the second frequency-dependent pre-
14   distortion signal.

1   23.   (previously presented) The method of claim 20, further comprising the step of
2   generating a frequency-independent pre-distorted signal from the input signal, wherein the frequency-
3   independent pre-distorted signal and the first and second frequency-dependent pre-distortion signals are
4   combined to generate the pre-distorted signal.

1   24.   (previously presented) The method of claim 20, wherein:
2   the input signal is represented in a base-band domain; and
3   the first and second frequency-dependent pre-distortion signals are generated in a digital domain.